Marta García Martínez

Principal Project Specialist - Computational Science
Argonne National Laboratory

Education

2005–2009	**Ph.D. in Fluid Dynamics**, *Toulouse Institute of Technology*, Toulouse (France)	01/19/2009

Ph.D. studies carried out at the European Centre for Research and Advanced Training in Scientific Computation (CERFACS), Toulouse (France)

Title: *Development and Validation of the Euler-Lagrange Formulation on a Parallel and Unstructured Solver for Large-Eddy Simulation*
Supervisor: Thierry Poinsot, Research Director (CNRS - French National Centre for Scientific Research).

1994–2001	**Engineer's Degree in Mechanical Engineering**, *Centro Politécnico Superior*, Saragossa (Spain)	02/22/2001

Final project carried out in the Mechanical and Aerospace Engineering Department, Sapienza University of Rome, Rome (Italy) under a Socrates/Erasmus Grant (1999-2000)

Title: *Numerical Simulation of the Effects of Components Deterioration in Gas Turbine Systems*
Major: Energy and Technology of Heat and Fluids.

Research Interests

My current research focuses on applying business and leadership principles to the management and execution of complex and challenging projects with multidisciplinary teams. Based on experiences from projects managed since 2013, I have particular interest in cross-functional, cross-organizational relationships and in understanding human dynamics between teams to build social capital. In addition, my research in the past years has been focused on topics related to high-performance computing (HPC), computational fluid dynamics (CFD), and most recently in the field of neuroscience through my joint appointment and collaboration with neuroscientists from the Feinberg School of Medicine at Northwestern University.

Positions and Experience

2018-present	**Principal Project Specialist - Computational Science**, *Computational Science Division*.	
	Argonne National Laboratory, Lemont, IL (USA)	
2016-2018	**Principal Project Specialist - Computational Science**, *Argonne Leadership Computing Facility*.	
	Argonne National Laboratory, Lemont, IL (USA)	
2010-2016	**Assistant Computational Scientist**, *Argonne Leadership Computing Facility*.	
	Argonne National Laboratory, Lemont, IL (USA)	
2009-2010	**Postdoctoral Researcher**, *Computational Fluid Dynamics Team*.	
	CERFACS, Toulouse (France)	

- Analyze dynamic load balancing and implementation of parallel partitioning algorithms (from ParMETIS library) for unstructured 3D CFD codes.
- Provide code and user support of the Lagrangian module developed during the Ph.D. and memory modules of the CFD code AVBP.

2002-2005	**Study Engineer**, *Computational Fluid Dynamics Team.*

CERFACS, Toulouse (France)
- Implement partitioning algorithms (from METIS library) for CFD computations.
- Support parallelism development, code debugging, profiling, and memory optimization of the CFD unstructured solver AVBP.
- Redact technical reports and code documentation of partitioning and parallel library.

2001	**Project Manager**.

INGEMETAL S.A., Saragossa (Spain)
- Construct the Burke Brise Soleil cover for the Milwaukee Art Museum addition (designed by Santiago Calatrava).
- Responsible for communication, work supervision, and interactions between American and Spanish working teams.

2000-2001	**Internship**, *Mechanical and New Materials Department.*

Aragon Institute of Technology, Saragossa (Spain)
- Acoustic measurements and viability studies.

Honors and Awards

2020   **Argonne Core Values Shout-Out**   06/11/2020
For excellent Computing, Environment and Life Sciences (CELS) Directorate Summer Lecture

2020   **Argonne Core Values Shout-Out**   05/29/2020
For helping foster a future generation of scientists and engineering in the nation supporting women in STEM

2019   **Argonne Core Values Shout-Out** - Teamwork   12/19/2019
For excellent team player during the organization of the 2020 ECP Annual Meeting

2019   **Argonne Core Values Shout-Out** - Teamwork   10/17/2019
For volunteering in the organization of Computational Science Division activities

2018   **Northwestern Argonne Institute of Science and Engineering** (NAISE)   06/20/2018
Senior Fellow

2018   **Argonne Pacesetter Award**   February 2018
For extraordinary effort in supporting and leading preparation efforts for the DOE Exascale Computing Project's Second Annual Meeting

2016   **Argonne Pacesetter Award**   September 2016
For extraordinary effort and leadership skills for the Argonne Training Program on Extreme-Scale Computing

2015   **ISC Research Poster Award**   07/13/2015
For "Performance Enhancement of an Internal Combustion Engine CFD Simulation on IBM BG/Q", J. Kodavasal, K. Harms, P. Srivastava, S. Som, S. Quan, K. Richards, and M. García. *ISC High Performance*, July 12-16, 2015, Frankfurt, Germany

2013   **Strategic Laboratory Leadership Program** (SLLP)   04/05/2013 - 11/08/2013
Selected by Argonne National Laboratory Director because of leadership abilities, collaborative thinking skills, exceptional work ethic, rigorous scholarship aptitude, and innovative and creative problem solving capabilities

2009   **Label C3I - Certificat de Compétences en Calcul Intensif**
Certificate awarded by the CPU (Conférence des Présidents d'Universités), GENCI and the *Maison de la Simulation* to Ph.D. holders who developed and applied skills in HPC during their Ph.D.

Grants and Proposals

2020   **Advanced Photon Source (APS) User Proposal for beamtime** (Role: Co-I)

    GUP-64547: 2-BM-A,B 2020-1   02/27/2020 - 03/02/2020
                2-BM-A,B 2020-3   *To be scheduled in 2021-1*
    Large volume feline spinal cord microtomography

2019-2021	**Laboratory Computing Resource Center (LCRC) Computing Award** (Role: PI)	

- **NAISE_MN_AVrate_3**: 700,000 core-hours on Bebop, Intel Broadwell & KNL — 1/4/2021 - 9/30/2021
  Modeling of motorpool output with respect to excitation and inhibition inputs
- **NAISE_Segment_ML**: 599,999 core-hours on Bebop, Intel Broadwell & KNL — 1/2/2020 - 6/30/2020
  Machine Learning for Semantic Segmentation of feline spinal cord images
- **NAISE_MN_AVrate_2**: 599,999 core-hours on Bebop, Intel Broadwell & KNL — 1/2/2020 - 6/30/2020
  Modeling of motorpool output with respect to excitation and inhibition inputs
- **NAISE_MN_AVrate**: 750,000 core-hours on Bebop, Intel Broadwell & KNL — 2/13/2019 - 9/30/2019
  Modeling of motorpool output with respect to excitation and inhibition inputs
- **NAISE_SI19_Segment**: 600,00 core-hours on Bebop, Intel Broadwell & KNL — 5/30/2019 - 9/30/2019
  Segmentation algorithms and pipeline for feline spinal cord studies
- **NAISE_SI19_Tuning**: 600,000 core-hours on Bebop, Intel Broadwell & KNL — 5/30/2019 - 9/30/2019
  Parameter tuning and analysis of motoneurons

2019 Argonne Leadership Computing Facility (ALCF) Computing Award (Role: PI)

NAISE_SI19_Segment: 8,000 core-hours on Cooley, Intel Haswell — 6/14/2019 - 10/01/2019
Segmentation algorithms and pipeline for feline spinal cord studies

2015-2016 Advanced Scientific Computing Research (ASCR) Leadership Computing Challenge (ALCC) Award (Role: Co-I)

CES_Analysis: 60,000,000 core-hours on Mira, IBM BG/Q (ALCF) — 07/01/2015 - 06/30/2016
Advancing Internal Combustion Engine Simulations using Sensitivity Analysis

2014-2016 Innovative and Novel Computational Impact on Theory and Experiment (INCITE) Award (Role: Co-I)

Comb_Deto: 150,000,000 core-hours on Mira, IBM Blue Gene/Q (ALCF)	01/01/2014 - 12/31/2014
150,000,000 core-hours on Mira, IBM Blue Gene/Q (ALCF)	01/01/2015 - 12/31/2015
140,000,000 core-hours on Mira, IBM Blue Gene/Q (ALCF)	01/01/2016 - 12/31/2016

First-Principles Simulations of High-Speed Combustion and Detonation

FY13-FY15 LDRD Strategic Initiative Grant (Role: Co-I)

P/ANL2013-148: $1,451,100 — 10/01/2012 - 09/30/2015
Development of Predictive Multi-dimensional Combustion Modeling Capability with Detailed Chemistry

Professional Development

2017-2020 Managerial Skills Series at Argonne National Laboratory
Participation in eight workshops ranging from topics on skillful conversations, conflict resolution and realizing talent in others to guiding collaborative discussion.

2019 Berkeley Executive Education — 05/02/2019 - 03/07/2019 (8 weeks)
Data Science: Bridging Principles and Practice

2018 The University of Chicago Booth School of Business - Executive Education — 07/23-27/2018 (1 week)
Engagement, Performance and Execution

2015 The University of Chicago Booth School of Business - Executive Education — 12/7-11/2015 (1 week)
Essentials of Effective Management: The Psychology of Management

2014 Chicago Collaboration for Women in STEM 2014 Career Development and Leadership Retreat
02/20-21/2014
Sponsored by the Office of the Provost at The University of Chicago and Northwestern University

2013 The University of Chicago Booth School of Business - Executive Education — 06/17-21/2013 (1 week)
Negotiation and Decision Making Strategies

Summer 2006	**Center for Turbulence Research (CTR) Summer Program** 07/09/2006 - 08/04/2006 (4 weeks) Participant of this biennial summer research program at Stanford University, whose objective is to promote the development and evaluation of new ideas in turbulence research.

Publications

Peer-reviewed Scientific Archival Publications

Meteorol. Z.'17	R. Paoli, O. Thouron, D. Cariolle, <u>M. García</u> and J. Escobar. "Three-dimensional large-eddy simulations of the early phase of contrail-to-cirrus transition: effects of atmospheric turbulence and radiative transfer", *Meteorologische Zeirschrift*, 26:597-620 (2017)
JERT'16	J. Kodavasal, K. Harms, P. Srivastava, S. Som, S. Quan, K. Richards and <u>M. García</u>. "Development of a Stiffness-Based Chemistry Load Balancing Scheme, and Optimization of Input/Output and Communication, to Enable Massively Parallel High-Fidelity Internal Combustion Engine Simulations", *Journal of Energy Resources Technology*, 138(5), 052203 (Feb 23, 2016) (11 pages)
J. Sci. Comput.'11	T. Poinsot, <u>M. García</u>, J.-M. Senoner, L. Gicquel, G. Staffelbach and O. Vermorel. "Numerical and Physical Instabilities in Massively Parallel LES of Reacting Flows", *Journal of Scientific Computing*, 49:78-93 (2011)
Proc Combust Inst 2011	F. Jaegle, J.-M. Senoner, <u>M. García</u>, F. Bismes, R. Lecourt, B. Cuenot and T. Poinsot. "Eulerian and Lagrangian spray simulations of an aeronautical multipoint injector", *In Proceedings of the Combustion Institute*, 33:2099-2107 (2011)
CSD'09	N. Gourdain, L.Y.M. Gicquel, M. Montagnac, O. Vermorel, M. Gazaix, G. Staffelbach, <u>M. García</u>, J.-F. Boussuge and T. Poinsot. "High performance parallel computing of flows in complex geometries: I. Methods", *Computational Science & Discovery 2* (November) 015003 (26pp) (2009)
CRM'09	J.-M. Senoner, M. Sanjosé, T. Lederlin, F. Jaegle, <u>M. García</u>, E. Riber, B. Cuenot, L.Y.M. Gicquel, H. Pitsch and T. Poinsot. "Eulerian and lagrangian large-eddy simulations of an evaporating two-phase flow", *Comptes Rendus Mécanique*, 337(6-7), 458-468 (2009)
JCP'09	E. Riber, V. Moureau, <u>M. García</u>, T. Poinsot and O. Simonin. "Evaluation of numerical strategies for LES of two-phase recirculating flows", *Journal of Computational Physics*, 228(2), 539-564 (2009)
AIAA J'08	J. M. Senoner, <u>M. García</u>, S. Mendez, G. Staffelbach, O. Vermorel and T. Poinsot. "Growth of Rounding Errors and Repetitivity of Large-Eddy Simulations", *American Institute of Aeronautics and Astronautics Journal*, 46(7), 1773-1781 (2008)

Book Chapters

2020	**Vertebrate Motoneurons**, Chapter: The cellular basis for the generation of firing patterns in human motor units. Authors: O. U. Khurram, G. E. P. Pearcey, M. K. Chardon, E. H. Kim, <u>M. García</u>, and C.J. Heckman. To be published by Springer Nature in their Advances in Neurobiology series. Editor: Michael O'Donovan, Senior Investigator, Developmental Neurobiology Section, NIH/NINDS
2019	**Contemporary High Performance Computing: From Petascale toward Exascale**, Chapter: Theta and Mira at Argonne National Laboratory. Publisher: CRC Press, Inc. (May 14, 2019). Editor: Jeffrey Vetter

Dissertation

2009	**Ph.D. Thesis**, "Développement et validation du formalisme Euler-Lagrange dans un solveur parallèle et non-structuré pour la simulation aux grandes échelles". <u>M. García</u>, CERFACS TH/CFD/09/1 (in english), Institut National Polytechnique de Toulouse - INPT, 2009 <tel-00414067>

Peer-reviewed Conference Proceedings

SAE 2016	J. Kodavasal, Y. Pei, K. Harms, S. Ciatti, A. Wagner, P.K. Senecal, <u>M. García</u> and S. Som. "Global Sensitivity Analysis of a Gasoline Compression Ignition Engine Simulation with Multiple Targets on an IBM Blue Gene/Q Supercomputer", *Society of Automotive Engineering (SAE) 2016 World Congress & Exhibition*, 16PFL-0871, 12-14 April 2016, Detroit, Michigan, USA

ICEF2015 J. Kodavasal, K. Harms, P. Srivastava, S. Som, S, Quan, K. Richards and <u>M. García</u>. "Scaling up a high-fidelity internal combustion engine simulation on an IBM Blue Gene/Q supercomputer", *In Proceedings of the ASME 2015 Internal Combustion Engine Division Fall Technical Conference*, ICEF2015-1035, November 8-11, Houston (2015)

SAE 2013 S. Som, D. E. Longman, S. M. Aithal, R. Bair, <u>M. García</u>. S. P. Quan, K.J. Richards, P.K. Senecal, T. Shethaji and M. Weber. "A Numerical Investigation on Scalability and Grid Convergence of Internal Combustion Engine Simulations", *SAE 2013 World Congress & Exhibition*, 13PFL-0587 / 2013-01-1095, April 16 (2013)

ICLASS 2009 F. Jaegle, J.-M. Senoner, <u>M. García</u>, C. Jiménez, B.Cuenot, and T. Poinsot. "Evaluation of simulation strategies for multipoint injection systems in aero-engines on the example of a liquid jet in a gaseous crossflow", *In 11th Triennial International Conference on Liquid Atomization and Spray Systems*, Paper Number 042, Vail, Colorado (2009)

ICMF 2007 <u>M. García</u>, E. Riber, O. Simonin and T. Poinsot. "Comparison between Euler/Euler and Euler/Lagrange LES approaches for confined bluff-body gas-solid flow", *In Proceedings of the 6th International Conference on Multiphase Flow*. CD-Rom - S3_Fri_A_62 - Leipzig (2007)

CTR'06 E. Riber, <u>M. García</u>, V. Moureau, H. Pitsch, O. Simonin and T. Poinsot. "Evaluation of numerical strategies for LES of two-phase reacting flows", *In Proceedings of the Summer Program 2006*, 197-211 (2006)

ECCOMAS'05 M. García, Y. Sommerer, T. Schönfeld and T. Poinsot. "Evaluation of Euler/Euler and Eu-ler/Lagrange strategies for large-eddy simulations of turbulent reacting flows", *In ECCOMAS Thematic Conference on Computational Combustion*. Lisbon (2005)

Invited Conference

VKI Lecture Series N. Gourdain, L.Y.M. Gicquel, M. Montagnac, O. Vermorel, M. Gazaix, G. Staffelbach, <u>M. García</u>, J.-F. Boussuge and T. Poinsot. "High performance computing of industrial flows: Application to aeronautic and propulsion challenges - invited conference", *In VKI Lecture Series on High Performance Computing of Industrial Flows*, Von Kármán Institute, Brussels (2009)

Conference Abstract

ASME 2014 R. Paoli, O. Thouron, J. Picot, D. Cariolle, <u>M. García</u>. "Large-eddy simulations of contrail-to-cirrus transition in the atmosphere", *Abstract for American Society of Mechanical Engineers (ASME) 4th Joint US-Europe Fluids Engineering Division Summer Meeting*, August 3-7, Chicago (2014)

Technical Reports

ECP AM'20 <u>M. García</u> and T. Munson. U.S. Department of Energy. 2020 Exascale Computing Project Annual Meeting (Executive Summary Report). Rpt # ECP-I-PO-RPT_2020_00003. May, 2020. Report published by OSTI

ECP AM'20 <u>M. García</u> and T. Munson. U.S. Department of Energy. 2020 Exascale Computing Project Annual Meeting - Final Feedback Form Results. Rpt # ECP-I-POD_2020_00102, Argonne National Laboratory, Apr 14, 2020.

ATPESC Multiple Exascale Computing Project Milestone Reports for the Argonne Training Program on Extreme-Scale Computing (ATPESC) (2017-2019): ADTR01-02, ADTR01-52, ADTR01-129, ADTR01-130, ADTR01-131, ADTR01-132, ADTR01-133, ADTR01-134, ADTR01-135, ADTR01-136, ADTR01-137, ADTR01-138, ADTR01-139, ADTR01-140, ADTR01-143, ADTR01-179

2009 <u>M. García</u>. "Partitionnement parallèle du maillage". Projet ANR CAMPAS, Deliverable L5 CR/CFD/09/119, CERFACS (December 2009)

2009 F. Jaegle, J.-M. Senoner, <u>M. García</u>, C. Jimenez, B. Cuenot, and T. Poinsot. "Comparison of Euler-Euler and Euler-Lagrange methods for liquid jet injection in a crossflow". TR/CFD/09/104, CERFACS (December 2009)

2009 E. Riber, V. Moureau, <u>M. García</u>, T. Poinsot, and O. Simonin. "Evaluation of numerical strategies for Large Eddy Simulation of particulate two-phase recirculating flows". TR/CFD/07/135, CERFACS (December 2007)

2007 <u>M. García</u>. "Interpolateur parallèle de solutions". Projet ANR CAMPAS, Deliverable L3 CR/CFD/07/149, CERFACS (July 2007)

2003 <u>M. García</u>. "Analysis of precision differences observed for the AVBP code". TR/CFD/03/84, CERFACS (2003)

Posters

2019   <u>M. García</u>. "Argonne Training Program on Extreme-Scale Computing 2019", *Application Development / Hardware & Integration / Facilities / Industry Poster Session*, 2019 Exascale Computing Project Annual Meeting, January 14-17, 2019, Houston, USA

2018   <u>M. García</u>. "Argonne Training Program on Extreme-Scale Computing 2018", *Application Development/Co-design, Hardware & Integration, Facilities Poster Session*, Exascale Computing Project 2nd Annual Meeting, February 6-8, 2018, Knoxville, USA

2017   <u>M. García</u>. "Argonne Training Program on Extreme-Scale Computing 2017", *Poster Session*, Argonne Exascale Computing Project Town Hall, January 24, 2017, Lemont, USA

ISC 2015   J. Kodavasal, K. Harms, P. Srivastava, S. Som, S. Quan, K. Richards, and <u>M. García</u>. "Performance Enhancement of an Internal Combustion Engine CFD Simulation on IBM BG/Q", *ISC High Performance*, July 12-16, 2015, Frankfurt, Germany

Web Articles / Blogs

VERIFI   Web article: *VERIFI code optimization yields three-fold increase in engine simulation speed* (2015)

ATPESC   Material:
- Web article: *Argonne training program prepares researchers for scientific computing in the exascale era* (2019)
- Blog: *Preparing the Next Generation of Supercomputer Users* (2019)
- Web article: *Leaning into the supercomputing learning curve* (2017)
- Video: *2016 ATPESC: training a new generation of supercomputer users* (2016)

Other

SC15   A. Insley, J. Kodavasal, X. Chai, K. Harms, <u>M. García</u> and S. Som. "Gasoline Compression Ignition: Optimizing Start of Injection Time", *SC 15 Visualization Showcase presentation*, Nov. 18, 2015, Austin, TX, USA.

DOE NSB'15   J. A. Insley, J. Kodavasal, Xi. Chai, K. Harms, <u>M. García</u> and S. Som. "Gasoline Compression Ignition: Optimizing Start of Injection Time", presented as an interactive kiosk at the *National Science Bowl*, April/May 2015, Washington, DC.

▬▬▬ Selected Invited Talks

2021	**CELS Coffee Time Lectures Series** Back-to-Back: NU, Argonne and UChicago efforts to understand the spinal cord	03/31/2021
2020	**CELS Summer Student Lectures Series** Machine Learning for Neurobiology and Biomedical Applications	06/11/2020
ATPESC 2019	**ATPESC 2019 Opening Presentation** Introduction to the ATPESC	07/28/2019
ATPESC 2018	**ATPESC 2018 Opening Presentation** Introduction to the ATPESC	07/29/2018
ATPESC 2017	**ATPESC 2017 Opening Presentation** Introduction to the ATPESC	07/30/2017
2017	**ALCF Postdocs Career Lunch Talks** My Journey of becoming a staff at ALCF	02/21/2017
VERIFI'16	**VERIFI 2016 Workshop** Hands-on Session (step-by-step)	06/23/2016
GSW'12-16	**ALCF Getting Started Videoconferences** (GSW) Speaker in multiple videoconferences over the years	2012-2016
Argonne Outloud'15	**Argonne Outloud - Public Lecture Series** Catch a Rising Science Star - What a Computational Scientist do?	09/10/2015

SCSW'15	**Science Careers in Search of Women 2015** Women in Computing Panel	04/16/2015
VERIFI'14	**VERIFI 2016 Workshop** Hands-on Session (step-by-step). Mira Job Submission	11/13/2014
WIST FFF 2014	**Women in Science and Technology First Friday Forum 2014** Panelist	03/13/2014
DOE CSGF'11	**2011 DOE Computational Science Graduate Fellowship Annual Conference** HPC Workshop - Pursuing Computational Science Research at the Argonne Leadership Computing Facility (wth P. Messina and N. Romero)	07/20/2011

Service

Community Leadership

2021	**INCITE 2022 Computational Readiness Review Committee**, *Co-Lead*
2020	**INCITE 2021 Computational Readiness Review Committee**, *Deputy Lead*
2020 ECP AM	**2020 Exascale Computing Project Annual Meeting**, *Program Co-Chair*
2019 ECP AM	**2019 Exascale Computing Project Annual Meeting**, *Program Chair*
ATPESC	**2016-2019 Argonne Training Program on Extreme-Scale Computing**, *Program Director*
NAWCN'18	**Northwestern-Argonne Workshop on Computational Neuroscience**, *Workshop Co-Chair*
2016	**Margaret Butler Symposium Committee**, *Co-Chair*
FY15 LDRD DCG	**Argonne Director's Review Committee (DRC) for the Laboratory Directed Research and Development (LDRD) for the Director's Competitive Grants (DCG)**, *Chair*
FY14 LDRD DCG	**Argonne DRC LDRD DCG**, *Vice-Chair*

Committee Membership

INCITE CR 2011-present	**INCITE Computational Readiness** Review Committee, *Member*
ATPESC 2016-present	**Argonne Training Program on Extreme-Scale Computing (ATPESC)** Review Committee, *Member*
2020	**ALCC 2021-2022** Review Committee, *Member*
IPDPS 2021	**International Parallel and Distributed Processing Symposium** (IPDPS 2021) Technical Program Committee, *Member Experiments Track*
SC20	**International Conference for High Performance Computing, Networking, Storage, and Analysis** (SC20) Technical Program Committee, *Member State of the Practice Area*
SC20	**International Conference for High Performance Computing, Networking, Storage, and Analysis** (SC20) Student Volunteers Program, *Reviewer*
SC19	**International Conference for High Performance Computing, Networking, Storage, and Analysis** (SC19) Student Volunteers Program, *Reviewer*
PCI'19	**Petascale Computing Institute** Organizing Committee, *Member & Argonne Host-Site Representative*
IPDPS 2019	**International Parallel and Distributed Processing Symposium** (IPDPS 2019) Technical Program Committee, *Member Experiments Track*
2016-2019	**Argonne University Partnerships Program** Technical Advisory Committee, *Member*
SC18	**International Conference for High Performance Computing, Networking, Storage, and Analysis** (SC18) Technical Program Committee, *Member State of the Practice Area*
2018 ECP AM	**2018 Exascale Computing Project Annual Meeting** Organizing Committee, *Member*

SPI'17	**Scaling to Petascale Institute** Organizing Committee, *Member & Argonne Host-Site Representative*
GSW'12-16	**ALCF Getting Started Videoconferences** Organizing Committee, *Member*
SBIR/STTR FY17	**Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) FY2017** Phase I Review Committee, *Member*
VERIFI'16	**Virtual Engine Research Institute and Fuels Initiative (VERIFI) 2016 Workshop** *Hands-on Session Organizer*
2014-2015	**Margaret Butler Symposium** Speaker and Planning Committee, *Member*
2014	**Argonne CORAL Proposal Evaluations** Programming Environment Committee, *Member*
VERIFI'14	**VERIFI 2014 Workshop** *Hands-on Session Organizer*
FY13 LDRD DCG	**Argonne DRC LDRD DCG Committee** *Member*

Community Service

2011-present	**ALCF Computational Performance Workshops**, *Support Staff*
2017-present	**ALCF Simulation, Data and Learning (SDL) Workshops**, *Support Staff*
SCSW 2021	**Science Careers in Search of Women 2021**, *Mentor - Scientist Small Group Session (Group 6)*
2021	**ALCF/NVIDIA GPU Hackathon**, *Mentor - Team SIGMA*
2021 NSB	**2021 Illinois Middle School Regional Science Bowl**, *Scorekeeper/Recognizer*
HOC 2020	**Hour of Code** (HOC), *Speaker in four STEM Chat presentations during Computer Science Education Week* (∼200 students)
2020	**APS/CELS Town Halls - A common vision for the future**, *Participant*
2020 IGED	**Argonne's Annual Introduce a Girl to Engineering Day (IGED)**, *Day-Staff*
2011-2019	**ALCF Data Center and Machines Room**, *Tour Guide for supercomputers: Intrepid, Mira, Theta*
2019	**AI for Science Town Halls**, *Participant*
OAR CY2016	**Operational Assessment Review (OAR) Strategic Results Section**, *Principal Author*
SC16	**International Conference for High Performance Computing, Networking, Storage, and Analysis** (SC16), *Argonne Representative*
IXPUG2016	**Intel Xeon Phi User Group Annual Meeting (IXPUG2016)**, *Session Chair, Top Ten Tutorial*
SCSW'12	**Science Careers in Search of Women 2012**, *Machines Tour Guide and Student Luncheon Volunteer*
Grace Hopper 2011-13	**Grace Hopper Celebration for Women in Computing**, *Argonne representative*
2011-13 IGED	**Argonne's Annual Introduce a Girl to Engineering Day**, *Mentor*
2008-2009	**French R&D Combustion initiate INCA (Initiative en Combustion Avancée website**, *Designer, developer and webmaster*
2007-2009	**CERFACS - Aviation and Environment Team website**, *Designer, developer and webmaster*
2006-2008	**FP6 CORDIS European project AETHER website**, *Designer, developer and webmaster*
2006-2007	**FP6 European project ECCOMET (Efficient and clean combustion experts training) website**, *Designer, developer and webmaster*
2004-2007	**FP6 European Marie Curie RTN project FLUISTCOM (Fluid-structure interaction for combustion systems) website**, *Designer, developer and webmaster*
2002-2009	**CERFACS - Computational Fluid Dynamics Team website**, *Designer, developer and webmaster*

Significant Project Involvement

2020-present   **Aurora Early Science Program** (ESP), Catalyst for Martin Berzins (Univ. of Utah) project

2018-present   **Aurora NRE Applications Working Group**, Member

2018-present   **Aurora NRE Compilers/MKL/MPI Working Group**, Member

2017-present   **Matlab licenses on Cooley**, Technical Representative

2014-present   **Install and maintain software on BG/P, BG/Q and other ALCF systems**

2018   **CORAL-2 Technical Evaluation Team**, Member

2015-2017   **CORAL NRE Compiler Working Group**, Member

2015-2016   **Theta Early Science Program** (ESP), Catalyst for Alexei Khokhlov (The Univ. of Chicago) project

2014   **CORAL Programming Environment Sub Team**, Member

2011-2018   **ALCF Support Staff replying to user tickets, report on internal meetings about project progress**, Member

Main Collaborations

2011-present   **Catalyst Role**
Catalyst and single point of contact for INCITE, ALCC and Director's Discretionary projects. PIs with whom I collaborated with are: Prof. George Karniadakis (Brown University), Susan Kurien (LANL), William George (NIST) and Prof. Adam Burrows (Princeton University), among others.

2019-present   **Shirley Ryan Ability Lab (SRALab)**
Collaborating with Northwestern Research Scientists from the Shirley Ryan Ability Lab to work in the development of biomechanical models that accurately represent the mechanical actions of the upper extremity muscles with the help of deep learning methods and image segmentation techniques.

2017-present   **Northwestern University**
Collaborating with Northwestern neuroscientists from The Heckman Laboratory (Department of Physiology, Northwestern University) to use computational resources to develop a model of a motoneuron pool to study the mechanisms underlying spinal cord stimulation.

2015-2020   **Argonne Training Program on Extreme-Scale Computing**
Collaborating with multiple renowned computer scientists and HPC experts from U.S. National Laboratories, Universities, and Industry who served over the years as lecturers during the two-weeks of the training program committed to provide continuous learning, personal growth, and professional development for more than 500 doctoral students, postdocs, and computational scientists participants since 2013.

2011-2017   **Convergent Science, Inc.**
Collaborating with Convergent Science, Inc., a world leader in CFD software, to use supercomputers to conduct engine simulations. My work focuses on improving CFD solver CONVERGE™ to run efficiently on HPC systems like Mira. Prepared Award Submission for 2016 R&D 100: 776815927768. Software/Services: *CONVERGE Version 2.3: Computational Fluid Dynamics Software*.

Advising and Mentoring

Ph.D. Committees

2020   **Ph.D. Preliminary Defense Committee - Sibo Li (University of Illinois at Chicago)**, *Member*
Title: Investigation of Aircraft Icing Based on Numerical Modeling and Machine Learning Methods

Postdocs

2018-2019   Mentor for **Matthieu Chardon** - Feinberg School of Medicine, Northwestern University

2017-2019   Mentor for **Gina Magnotti** - Energy Systems Division, Argonne National Laboratory

2015-2016   Mentor for **Preeti Malakar** - Leadership Computing Facility, Argonne National Laboratory

2013-2016   Co-Advisor for **Janardan Kodavasal** - Energy Systems Division, Argonne National Laboratory

Staff

2012   Mentor for **Avanthi Lalitha Mantrala** - Leadership Computing Facility, Argonne National Laboratory

NAISE Summer Students

2019   Advisor - **Josh Pritz** - *Optimizing Neural Network Performance for Image Segmentation*

2019   Advisor - **Nicole Camburn** - *Using Computational Methods as an Alternative to Manual Image Segmentation*

Computer Skills

Prog. Lang.	Fortran; notions in C.
Parallel	MPI; notions in OpenMP.
Debug & Profile	Darshan, HPCToolKit, TAU, notions in Allinea DDT, Totalview, core-processor, mpiP, gdb, gprof, ssrun, Scalasca.
System	Unix, Linux, Mac OS X, Windows.
Viz	notions in Paraview, VisIt, Tecplot, Ensight, Fieldview.
Codes	AVBP, METIS, ParMETIS, HDF5, Code_Saturne, OpenFoam, Converge, HSCD, Fornax, Uintah.
Web	HTML, PHP, CSS, Wordpress, Cvent, RegOnline.
Other	LaTeX, Word, Excel, PowerPoint, Globus, Petrel, Tableau, GitHub, Cobalt, modules, Spack, vi, Bash, BATS, modules, Box, Slack, Confluence, BlueJeans, JIRA, SurveyMonkey, Dayforce, virgin Pulse, Workday.
User	GPFS, HPSS, Lustre; 3D and 5D Torus, Aries Dragonfly topology; IBM XL and Intel compilers.

Languages

Spanish	**Mother tongue**	
English	**Written, read and spoken fluently**	*Daily use in the working environment (2010-present)*
French	**Written, read and spoken fluently**	*Daily use in the working environment (2002-2010)*
Italian	**Read and spoken fluently; good written**	*Daily use in the family environment (1999-present)*
German	**Notions**	

Personal Interests

- **Reading** (whenever I have a second...)
- **Cooking** for family & friends
- I also love **Art**, **Architecture** and how both intermix
- **Traveling** to different cities and countries
- **Swimming** in winter and **running** in summer